

Inalambric Biofeedback Devices to Analyze Strength Manifestation in Military Population

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Abstract

The study of the effect of stress on both combatants physiological and anatomical systems have been poor studied in the specific literature. The present research aimed to study the effect of combat stress in strength manifestations of leg flexor-extensor muscles and the anaerobic metabolism of soldiers. Before and after asymmetrical combat simulation were analyzed parameters of blood lactate concentration, explosive leg strength manifestation and contractile capacity of leg muscle in 186 professional soldiers. Results showed a significant increase ($p < 0.05$) in blood lactate values (2.23 ± 0.95 vs 7.47 ± 3.67 mmol/L), explosive leg strength (Squat Jump 0.31 ± 0.06 vs 0.35 ± 0.07 m, Countermovement Jump 0.33 ± 0.07 vs 0.36 ± 0.07 m, Abalakov Jump 0.39 ± 0.08 vs 0.41 ± 0.09 m), and a significant decrease of the elastic capacity (0.022 ± 0.04 vs 0.021 ± 0.04) and recruitment and muscle synchronization capability (0.028 ± 0.04 vs 0.026 ± 0.04). This data suggest that combat stress increases the leg strength manifestation despite the significantly increase of muscle acidosis after a combat simulation. This result is probably due to the high activation of the fight-flight system of soldiers which increases the organic response of soldiers and that can compensate the prejudicial effect of acidosis in muscle contraction. These results could be used by officers to improve specific training programs and to improve planning and election of equipment and material for the development of different missions in current theaters of operations.

Keywords:

Fight-flight system, Combat stress, Lactate, Soldier, Jump, Training